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ABSTRACT

Research on schema theory and the psycholinguistic perspectives of reading suggest that the measures of readability currently used on second language tests be reconsidered. Because foreign language readers, especially in the early stages of language learning, often do not have the necessary schema or background knowledge, teachers should include schema-inducing methods to prepare students for reading in a foreign language. The standards of what is readable and judgments as to what is understandable should always be relative to a particular instructional setting. Using traditional methods to measure readability is undesirable for foreign language reading because of students' insufficient linguistic and cultural background information. With the current knowledge of the factors interacting during the reading process, artificial and arbitrary means for classifying materials should be avoided. (MSE)

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Readability Formulas and Schema Theory: A Look at Predicting and Measuring the Difficulty of Foreign Language Texts

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Readability Formulas and Schema Theory: A New Look at Predicting and Measuring the Difficulty of Foreign Language Texts

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Most of the readability research done in the country focuses on English language texts. Research on the readability of foreign language texts is quited limited (Schulz, 1981). Schulz called for a "large scale effort to validate readability criteria for literary texts in all commonly taught languages and to research the relative linguistic difficulty of literary works for American foreign language instruction" (p. 52).

In this paper, I will first offer a minimal review of the literature regarding the "failure" of readability formulas as means of predicting or assessing the level of difficulty of a particular text. Later, I will discuss some current research on the process of reading, with specific references to foreign language reading. The major discussion, however, will center around the psycholinguistic view of reading and around what is now being called Schema Theory and their implication for readability measures of foreign language texts.

In measuring the readability or difficulty of written materials, the most common means has been through the use of standard statistical formulas. The formulas are basically of two types: those which use factors such as word and sentence length (Fry, 1968; Dale and Chall, 1948) and those which attempt to measure readability through syntactic complexities (Botel, Dawkins and Gronowsky, 1973; Kidder and Golub, 1978). In the past two decades, readability formulas and readability of texts

have received much attention and criticism from researchers who seem to agree upon what may affect the reader's understanding of a particular piece of written materials (Luiten, Ames and Bradley, 1979). There seems, however, to be a failure on the part of the researchers to include in their definition of readability factors which reflect the characteristics of the individual reader and to take into account the difficulty of ideas or concepts within the reading texts.

The major criticism of readability formulas is that a criterion on comprehensibility cannot be reliably determined, and that word frequency and sentence length do not stand in a simple relationship to reading difficulty. Also, readability formulas do not consider difficulty caused by factors such as concept load, format of the material, organization of the ideals, or the writing patterns of the authors (Hittleman, 1978). Schulz (1981) pointed out that readability formulas do not take into account "nonidiomatic uses, nonsense combinations or awkward and confusing sentence structures" (p. 47).

Another important point to make regarding readability formulas is that they are based on a list of "familiar and easy words" to measure or predict readability of a passage. The use of these lists is questionable when we consider that there is no compensation for the different use of certain words and for abstractness. Hittleman (1973) offered a very good example with the sentence: "there was a run on the bank after the powerful king's speech" (p. 784). All of the words in the above sentence

are on the Dale List of familiar words. The question of whether readers can quess the meaning of run in this context has to raised. Also, using word lists brings about another observation: who determines which words are familiar to a certain group of readers? Is "policeman" more familiar than "cop"? The word "policeman" appears on the Dale List, but "cop" does not.

In addition to the commonly used readability formulas, there are two other methods of measuring the difficulty of texts: teacher judgement and the Cloze procedure (A reading passage which has been multilated by the systematic deletion of every nth word. Readers must provide a logical word for the deleted word.) Teachers can usually make a good assessment of readability of a text for their students. Sometimes, however, teachers may underestimate the linguistic difficulty of a text with which they are thoroughly familiar or personally enjoy. The Cloze procedure can be used to determine or measure the readability of a particular text for a particular group of students. The disadvantage, however, is that the procedure cannot be used to predict readability.

In this country, readability measures of foreign language texts are limited to formulas originally designed for the English language. Let us look, for example, at the formulas that are available for Spanish, the most widely taught foreign language in the United States. In 1956, Spaulding devised a procedure for measuring the relative difficulty of Spanish written materials for native English speakers. His index of readability is,

however, similar to the Dale-Chall criteria in that it is based on average sentence length and number of words not appearing on a list of words with high frequency in Spanish. More recently, Gilliam, Pena and Mountian (1980) and Vari-Cartier (1981) have devised instruments to assess the readability of Spanish prose. Both instruments are based on Fry's Readability Graph because of, as Vari-Cartier put it, "its general acceptance as an easy and accurate method of predicting reading difficulty" (p. 141). In both the Gilliam, et al. and the Vari-Cartier scales adjustments were made to accomodate the linguistic peculiarities of the Spanish language. The shortcomings, however, of the formulas are the same as those outlined above for first language readability formulas.

The psycholinguistic model of first language reading, advanced by Goodman (1970), offered a framework for research in foreign and second language reading. The psycholinguistic approach defines reading as an interaction among three factors: conceptual abilities, background knowledge, and process strategies (Coady 1979). Each of these factors will be discussed below. The result of the successful interaction of these factors is comprehension. As Bernhardt (1986) noted, an important contribution of this approach is that it underlines the notion that reading involves readers and not just the reading text. Present research in first and second reading has shifted from the psycholinguistic perspective to a schema-based or conceptually driven perspective (Bernhardt, 1986), which pays close attention

to the reader in the reading process.

FOREIGN LANGUAGE READING PROCESS

While there are some similarities in the process of learning to read for comprehension in the first and second language, there are some very important differences which make the task of measuring readability for foreign language texts more difficult. Phillips (1984) noted that good native language reading strategies, while helpful to the foreign language reader, do not necessarily "automatically transfer" (p. 285) to foreign language reading. Similarly, Clarke (1980) discovered that the differences between good and poor readers were minimal when they were confronted with a foreign language text.

Yorio (1971) outlined the following factors that should be considered when approaching foreign language reading:

1. the reader's knowledge of the foreign language differs from that of a native speaker;

2. the guessing or predicting ability necessary to pick the correct cues is hindered by the imperfect knowledge of the language;

3. the wrong choice of cues or the uncertainty of the choice makes associations more difficult;

4. due to unfamiliarity with the material and the lack of training, the memory span in a foreign language in the early stages of acquisition is usually shorter than in our native language; recollection of previous cues then, is more difficult

in a foreign than in the mother tongue;

5. at all levels, and at all times, there is interference of the native language.

BACKGROUND KNOWLEDGE

Cognitive psychologists in the 1960s stressed great emphasis on the importance of meaningfulness and organization of background knowlegde in the learning process. Ausubel (1968) posited that learning must be meaningful to be effective and permanent. That is, learning must involve active mental processes and be relatable to existing knowledge the learner already possesses. The mind, when involved in meaningful learning, will organize the new materials into meaningful chunks and relate them to existing cognitive structure in a way that they will be become "implanted" (Ausubel, 1968, p. 76). Ausubel (1968) suggested that educators provide "advance organizers" for new material whenever possible to facilitate the learning process. The foregoing observations are especially revelant to foreign language learning, and particularly significant with regards to learning the receptive skills-- reading and listening.

In the foreign language comprehension process, researchers agree that at least three types of background knowledge are potentially activated: (1) linguistic information, or one's knowledge of the code; (2) knowledge of the world; and (3) knowledge of discourse structures (such as conversations, radio broadcast, literary texts, newspaper accounts, fables, political speeches, etc) (Omaggio, 1986). The role played by background

knowledge in language learning is formalized in a theoretical model known as Schema theory. One of the basic tenets of the theory is that any given text does not carry meaning in and of itself. According to schema theory, the "text only provides directions for listeners and readers as to how they should retrieve or construct meaning from their own, previously acquired knowledge" (Carrell, 1983, p. 556).

The schema-theoretic and psycholinguistic views of reading comprehension are especially important to foreign language reading because a foreign culture is generally reflected in the reading materials of a classroom. A study of the importance of cultural background in reading such as the one done by Steffenson, Joag-Dev and Anderson (1979) serves to reiterate the point. In their study, they concluded that those reading a foreign language text that include elements of their own cultural background will read and comprehend more easily than those readers who lack the same cultural heritage.

CONCEPTUAL ABILITIES

A reader must first be able to understand and be familiar with the concepts presented in a reading text. Of course, level of difficulty is closely related to experiential background. Conceptual abilities are directly related to general intellectual adeptness. Individuals who read a high level document on the economy of the Soviet Union will not fare well if they are not familiar with economics or Russian culture. In a study by Ribovich (1979) on the effects of informational background on

various reading-related behaviors in adult subjects, he tested twenty-five students of education and twenty-four students of economics. The students in education read a passage on "Why is Pure Competition Vanishing?" while the students in economics read an article entitled "The Open School Space: How Does it Work?". The economic students performed better in their comprehension tasks of the education text that did the education students on the economic text. One of the conclusion was that the education majors were unfamiliar with economics, but the economics students, by mere attendance in school programs, were well equipped to comprehend all the concepts in the education article.

PROCESSING INFORMATION STRATEGIES

The mental processing of information is based on the notion that humans inherently strive to make sense of the world. This process is complex with regard to reading, and its complexity is enhanced when related to foreign language reading. Process strategies refer to what Phillips (1984) called `mental subroutines' that a reader uses in order to comprehend what is read. In reading, this process involves a knowledge of the phonology, morphology, and the syntax of the language involved. A successful foreign language reader must, then, be able to decipher written symbols and assign meaning to them. This process is either hindered or facilitated by the oral competency in the target language.

In the literature on schema theory regarding information processing, two types of processing strategies have been

identified: "bottom up" and "top down". The underlying principle of the process of interpreting information is that all incoming "data" is "mapped against some existing schema and all aspects of that schema must be compatible with the input information" (Carrell, 1983, p. 557) for comprehension to occur. For simplication of the "bottom-up" and "top-down" processes, let us imagine the shape of an hour glass with its two bulbs at the top and bottom. Now, we must imagine that the sand (incoming information) in the hour glass (the comprehension system) can trickle both up and down simultaneously. The glass bulb at the top contains very high order concepts and knowlegde; the bulb at the bottom contains very general--bits and pieces--of knowlegde. When an individual reads or listens, the new information enters the "comprehension system" at the bottom and must converge with and activate the higher level concepts, if there are any, so that comprehension can occur. As Carrell (1984) suggested: "Bottom-up processing insures that the reader will be sensitive to novel information; top-down processing helps the reader resolve ambiguities, i.e., to select between alternative possible interpretations of the incoming data" (p. 333).

Research on the psycholinguistic and the schema-theoretic perspectives of reading leads us to rethink the measures of readability presently being used. Because foreign language readers, especially at the beginning stages of learning, often do not have the necessary schema or background knowlegde, teachers should include schema-inducing methods to prepare students for

the task of reading in a foreign language (Zvetina, 1987). The standards of what is readable and our judgements as to what is understandable should always be relative to a particular instructional setting. Bernhardt (1984) has persuasively argued that basing readability on the traditional methods is undesireable for foreign language reading. She clearly demonstrated that some passages may be deemed "very easy" on a readability scale, but, from an information processing perspective, may be "very difficult", if the reader is unable to interact with the text because of insufficient linguistic and cultural background knowledge. With the current knowledge of the factors that interact during reading, it is unadvisable to rely on artificial and arbitrary means for classifying reading materials. In establishing readability guidelines, we should never eliminate the reader and the act of reading from our concept of readability (Hittleman, 1978).

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